Space Weather Forecast

Issued on Saturday, 16 March 2024 at 01:14 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of Moderate-class flares (R1/R2 Radio Blackouts). Ongoing S1/Minor Radiation Storm easing, falling below thresholds later day 1 (16 Mar).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with a long period flare peaking at 15/0610 UTC from the complex region over the west limb. There are currently four numbered sunspot regions on the visible disc, and one new unnumbered spot in south-centre disk. All regions are small and simple at present, with very little recent change to any of the numbered spots.

The long period flare produced a Coronal Mass Ejection (CME) directed towards the southwest. Given the location it seems unlikely it will have a significant Earth directed component, though Earth may experience a weak shock in coming days.

Solar Wind / Geomagnetic Activity: Solar wind speeds were slow-ambient to slightly elevated. The Interplanetary Magnetic Field was weak. The north-south component was mostly positive and varied weakly. Geomagnetic activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: Solar radiation was initially at background levels, but rose after the long period flare, rising above the S1 Radiation Storm level from 15/2050 UTC.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a slight chance of Moderate-class flares throughout, initially from an off-going active region and later from a returning active region.

Solar Wind / Geomagnetic Activity: None of the coronal mass ejections seen in coronagraph imagery have been deemed Earth-directed. However, there are two coronal mass ejections which may give minor glancing impacts, and the coronal mass ejection associated with the long period common-class flare early on 15 Mar may give shock effects at Earth in the period. Any of the glancing or shock effects are most probable on days 2 and 3 (17 or 18 Mar). Otherwise solar winds are expected to remain at Slightly Elevated to Slow-Ambient levels, perhaps with a minor coronal hole enhancement.

Mostly Quiet or Unsettled (Kp 0-3) conditions are expected over the period, with a chance of an Active (Kp 4) and a Slight Chance of G1/Minor Storm (Kp 5) intervals on days 2 and 3 (17 &18 Mar) should any of the 2 glancing CMEs/the CME shock or a stronger connection to the CH10/-HSS occur.

Energetic Particles / Solar Radiation: Proton flux at GOES18 rose above the S1/Minor Radiation storm threshold from 15/2050 UTC. The risk of further proton events remains until later on 16 Mar, with a decline in probability thereafter. The current elevated proton count is expected to gradually decline through day 1, likely falling below the S1/Minor Radiation storm threshold by day 2 (17 Mar).

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	20	20	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	20	20	20
Very Active	R3 to R5 X	No	1	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	90	20	5	1
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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